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ABSTRACT

The rapid expansion of Ontario's educational system in the 1960s serves as a base for this study of the current decline in enrollment and its consequences. This paper examines two results of the concentration of manpower in teaching: the need for reduction in force and the potential burden on the retirement system. The author makes several observations based on a reduction-in-force scheme that encourages the retirement of eligible teachers and limits the number of new entrants into the profession. He perceives probable relief from escalating salary costs until 1985 followed by a sharp rise in costs resulting from replacement of retirees, possible short-run economies in teacher education, and the desirability of creating a pool of qualified and experienced teachers. He also concludes that the Ontario superannuation plan, which was established during a period of educational and economic growth, will create an overwhelming burden on a provincial government faced with declining enrollment. Consequently, he recommends not extending any further benefits to teachers and sees increased teacher contribution to the retirement fund as unavoidable. (Author/WD)

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WORKING PAPER NO. 7

DECLINING ENROLMENTS AND THE AGING TEACHING FORCE

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MARCH, 1978

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DECLINING ENROLMENTS AND THE AGING TEACHING FORCE

1.0 THE GENERAL PROBLEM

Much of the concern over the problems associated with declining enrolments tends to be focused on the immediate problems to be faced by government, profession and administration during the years of enrolment decline. This paper, while accepting that declining enrolments will create many problems during the next ten years, in addition draws attention towards serious problems which will begin and continue after the immediate impact of the decline.

These problems have their roots in the rapid expansion of the education system of the 1960's and the influx into the profession of huge numbers of teachers. Since it is not expected that the school system will disappear in its entirety, it may be presumed that teachers who joined the profession during its period of greatest growth will, less attrition, remain with it until the time of their retirement.

This paper examines two aspects of the results of this concentration of manpower in the teaching profession. Section 1 attempts to define the problem and present some of the consequences of it for the school system, the teacher training system. Section 2 presents the problem in the context of the potential burden on the superannuation system.

The publications listed in the bibliography have provided the source of most of the data included in the report. Although specific sources have been acknowledged for the most part, there are some cases where the source is made obvious by the context.

1.1 Age Distribution of the Teaching Force

Table 1 provides the age distribution of the teaching force

(persons holding established positions in the system) in Ontario Public, Separate and Secondary schools for the year 1974-75.

Table 1

AGE DISTRIBUTION OF THE ONTARIO TEACHING FORCE
by Sectors for 1974-75 (Sept. 1975)

ELEMENTARY				
<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>%</u>
19 & under	14	168	182	.3
20-29	9,067	22,276	31,343	52.5
30-39	6,684	9,395	16,079	26.9
40-49	2,139	5,199	7,338	12.3
50-59	703	3,206	3,909	6.5
60-65	84	610	694	1.2
66		6	6	.1
Not Reported	34	108	142	.2
	<u>18,725</u>	<u>40,968</u>	<u>59,693</u>	<u>100.0</u>

SECONDARY				
<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>%</u>
19 & under	5	4	9	
20-29	6,530	5,017	11,547	35.1
30-39	9,493	2,208	11,701	34.6
40-49	4,933	1,516	6,449	19.3
50-59	2,148	1,049	3,197	9.5
60-65	188	132	320	1.0
66	2	2	4	
Not Reported	<u>86</u>	<u>64</u>	<u>150</u>	<u>.5</u>
	<u>23,385</u>	<u>9,992</u>	<u>33,377</u>	<u>100.0</u>

Source: Ontario Ministry of Education,
Toronto, September 1975

From this table it becomes apparent that as one consequence of the increasing enrolments of the 1960's, a substantial proportion of teachers in the elementary school system are relatively young. Of the total of 59,693 teachers in the system in the year 1974-75 52.5 percent were between 20 and 29 years of age. The

next largest group were in the 30-39 year group, 26.8 percent. Thus in 1975 almost 80 percent of the elementary teaching force was less than 40 years of age. The position with respect to the secondary teaching force is similar with 35 percent of the force falling in the 20-29 age group and a total of close to 70 percent in the under 40 group. Data available from the December 31, 1975 actuarial report on the Teachers' Superannuation Fund provides a more precise breakdown of the teaching force (in this table defined as active contributors to the fund) by age for that year but does not provide information on the distribution of the teaching force by sector or a matching breakdown by experience. Table 2 provides the details.

Table 2				
AGE DISTRIBUTION OF ONTARIO ACTIVE TEACHING FORCE as of December 31, 1975				
	MALES	FEMALES		
<u>Age Group</u>	<u>Number</u>	<u>Number</u>	<u>Total</u>	<u>%</u>
Under 25	1,330	6,749	8,079	7
25-29	11,081	22,058	33,139	28
30-34	11,831	12,735	24,566	21
35-39	9,161	8,875	18,036	15
40-44	5,941	6,173	12,114	10
45-49	4,319	4,914	9,233	7
50-54	2,940	3,669	6,609	6
55-59	1,689	2,617	4,306	4
60 and over	930	1,908	2,838	2
	49,222	69,698	118,920	100

Source: Actuarial Report on the Teachers' Superannuation Fund as of December 31, 1975

This table shows that 35% of the total active teaching force is less than 30 and that 75% is less than 40. It also suggests in 1975 fewer than 12% were of the minimal retirement age of 55.

It is worth noting that Table 1 and Table 2 although covering approximately the same period show a discrepancy of almost 25,000 teachers. The Ministry report (Table 1) is based on the number of teaching positions in the system and the data reported is that related to the teacher holding the position at the time the report was completed. The actuarial report (Table 2) is based on active teachers who are defined as those who contributed to the fund for at least 20 days in the period September to December 1975. Thus the actuarial report accounts for a substantial number of teachers on short term contracts or who may have been replacing full time teachers for such reason as maternity leave or sickness. Furthermore the actuarial report includes numbers of contributors who are not actually employed in the public school system but are nevertheless eligible for inclusion in the superannuation plan. Such contributors include for example instructors in Teacher Education Colleges and the academic staff of Ontario Universities who may have elected to remain within the Teachers Superannuation system rather than join the University Superannuation Plan.

For the purpose of this report the discrepancies are not held to be of overwhelming significance. Although examination of the Tables suggests that the discrepancies are greatest for the 30-39 age group and that as a consequence, short-term contracts are concentrated in that group, there is no evidence to suggest that the discrepancies can be associated with any particular age group. Therefore Table 2 does little to change the pattern of age distribution of the teaching force revealed by Table 1.

For the purpose of Section 1 of this report the two tables provide mutually supporting information. For the purpose of Section 2 and 3 of this report, Table 2 is held to be more appropriate.

1.2 Experience of the Teaching Force

The position with respect to experience is not, as might be expected, dissimilar. Table 3 provides a breakdown of the Ontario teaching force by years of experience as it was in 1974-75.

<u>Table 3</u>				
EXPERIENCE DISTRIBUTION OF THE ONTARIO TEACHING FORCE by Sectors for 1974-75				
Total Teaching Experience, Years	ELEMENTARY			
	Male	Female	Total	%
Beginners	754	1,766	2,520	4.2
01-10	10,746	25,442	36,188	60.0
11-20	5,430	9,302	14,732	24.6
21-30	1,495	3,410	4,905	8.2
31-40	269	974	1,243	2.0
41-50	31	74	105	
51+				
Not Reported				
	<u>18,725</u>	<u>40,968</u>	<u>59,693</u>	<u>100.0</u>
Total Teaching Experience, Years	SECONDARY			
	Male	Female	Total	%
Beginners	772	620	1,392	4.0
01-10	13,084	6,576	19,660	58.0
11-20	7,315	1,952	9,267	27.0
21-30	1,850	619	2,469	7.0
31-40	348	223	571	1.0
41-50	16	2	18	
51+				
Not Reported				
	<u>23,385</u>	<u>9,992</u>	<u>33,377</u>	<u>100.0</u>

Source: Ontario Ministry of Education, Toronto, September 1975

The table reveals that in 1974-75, 65 percent of elementary school teachers had 10 or fewer years of experience and that a total of almost 90 percent had 20 or fewer years of teaching experience. In the secondary school teaching force 63 percent had 10 or fewer years of experience and slightly over 90 percent had 20 years or less teaching experience.

1.3 Projected Age and Experience of the Teaching Force

The age and experience tables indicate clearly that the teaching force in the Ontario school system is a young and relatively inexperienced one at this time. One might argue that the picture may be somewhat misleading given the high proportion of females (37% of the total 52%) in the elementary under 30 age group. Under traditional assumptions it would be considered that a significant part of this group might withdraw temporarily from the teaching force to raise families and seek to reenter at a later date. However, given the current unfavourable economic conditions and generous provision of maternity benefits contained in most collective agreements, it may well be that the expectation may prove erroneous. Nevertheless the concentration of the teaching force into an age cohort which is relatively homogeneous with respect to age and experience constitutes a potentially powerful interest group who may be expected to share a vested interest in keeping their jobs during the period of projected decline in enrolments. It may be suggested that their bargaining positions will reflect this interest, conceivably at the expense of other age and experience cohorts.

It might be realistic, therefore, to assume that teacher organizations will adopt bargaining strategies that will seek to safeguard teaching positions on the basis of seniority. There is already evidence that this assumption is justifiable. The

Education Relations Commission, for instance, reports that for 1976-77 salary agreements filed with the Board, 65% contained redundancy provisions. For 1977-78 the percentage containing redundancy provisions increased to 72%. In 67 out of the 72 agreements reported for 1977-78 on file, seniority and experience were major factors in deciding redundancy. If the assumption holds true then one may forecast that reductions in staffing will tend to be met from retirements and by limitations in the hiring of new teachers, presumably graduates of Colleges and Faculties of Education. Nor does it appear unreasonable that these strategies will be impossible to fulfill.

For instance, a recent estimate has suggested that there will be a decline of approximately 3,700 elementary teachers and 5,500 secondary teachers between 1975 and 1985.¹ Since there are no formal restrictions on the movement of teachers between elementary and secondary school systems, it might be more appropriate to think in terms of overall reduction in the number of teachers rather than to draw distinctions between elementary and secondary systems.

Thus between 1975 and 1985 the above data suggests there will be a reduction of 9,200 in the number of teachers required. Extension of the data provided in Table 2 shows that by 1985 almost 23,000 of the 1975 teaching force will have reached or passed the minimum retirement age of 55. Whilst it is not possible to forecast with any degree of certainty the actual number who will be entitled or willing to take advantage of retirement before age 65, it appears fairly clear that potential retirements will more than account for the reduction in the needed size of

¹Ontario Education Dimension, Toronto Ministry of Education, December 1977.

the teaching force, assuming no new entrants to the profession. Further reference to Table 2 suggests that if only that group which will be aged 65 or over in 1985 is considered, the reduction in the teaching force may be almost totally accomplished through attrition of those reaching compulsory retirement age. If a substantial number of those eligible for retirement at age 55 do so, there will be a demand for additional teachers even during the most severe period of decline. Since Table 1 does not provide a breakdown of the age distribution of the teaching force by 5 year intervals, it is not possible to provide extensions of data similar to those based on Table 2. Nevertheless an extension of Table 1 suggests that by 1985 almost 8,500 teachers will be between 60 and 69 years of age and that a substantial proportion of these will have passed the mandatory retirement age of 65. A further 13,000 teachers will on the basis of Table 1 be between 50 and 59 years of age and a significantly large group of these will be eligible for retirement.

The use of data from Table 1 certainly weakens the strength of the argument based on data from Table 2 but since the essential argument is that attrition will be the primary method of adapting to reducing enrolments during this period, the difference arrived at by the use of two different sets of data is one of degree rather than direction.

The cohort in the 1975 distribution aged 25-39 will of necessity increase as a proportion of the total teaching force. Furthermore this cohort will not reach retirement age until early in the 21st century. The cohort in 1975 aged 30-34 will not attain the minimum retirement age until 2005 and the larger group aged 25-29 in 1974 will not reach minimum retirement age until 2010. In the meantime, however, the average teacher in the cohort,

which could contain as much as 65 to 70 percent of the teaching profession will in 1990 be more than 40 years of age.

1.4 Problems Associated with Change Age Distribution

1.41 Attitudinal Problems

The significance of this large cohort, which one may assume will be largely untouched by declining enrolments, should not be underestimated and a variety of problems may be expected. One might speculate that the cohort will become increasingly militant as a consequence of attempting to maintain job security in face of declining enrolments and attempting to maintain its relative economic position in the 1980's, a time during which the Ontario Economic Council suggests people will be concerned with "intensified labour conflicts, particularly in the public sector."² Alternatively one might speculate that this cohort facing as it does the prospect of spending twenty-five or thirty years in a work situation which will provide for little vertical horizontal mobility will become bored and apathetic or frustrated.

1.42 Cost Problems - Increments for Experience and Qualification

On the other hand the existence of this cohort does offer the possibility of relief from escalating cost. Current negotiated salary scales provide automatic increments for experience. The effect of such increments is to increase total annual salary costs by more than that which would be suggested by negotiated percentage increases on the grid. Such negotiations tend to reflect increases in the "cost of living" and national productivity.

²Foot, D.K., J. Pesanda, J.A. Sawyer, and J.H. Winder, The Ontario Economy, 1977-78 (Toronto, Ontario Economic Council, 1977, p. 2).

There has been a trend in the most recent years to compression of the number of years between minima or maxima on salary grids. Data available from the Educational Relations Commission shows that the majority of salary contracts in the Province for 1977-78 require between ten and twelve years of experience to attain maximum salary. As Table 3 shows 64 percent of elementary teachers and 63 percent of secondary teachers in 1975 had ten or fewer years of experience. That is to say a minimum of 36 or 37 percent of teachers were not receiving salary increments in excess of basic grid settlements. This proportion will increase steadily until somewhere around 1985 when it will stabilize as a consequence of the entire cohort having passed through the experience increment stage. Those who will not be receiving experience increments at this time will be the relatively small number of new entrants to the profession. However, increasing enrolments and retirements after 1985 will lead to an increase in the number of less experienced teachers and thus lead to an increase in overall cost per teacher.

The forecast of some reduction of cost escalation may be modified by considerations of the qualification picture. Table 4 provides details of the qualifications of the Ontario teacher force in 1975.

Although the minimum requirement for permanent certification for secondary teachers has been an undergraduate degree plus one year of professional education for many years, it was not until 1973 that new elementary teachers were required to meet the same standards. The introduction of the new requirements permitted teachers qualified under the previous requirements to maintain their certification.

Table 4 shows that the problem of under qualification is not

Table 4

DISTRIBUTION OF THE ONTARIO TEACHING FORCE BY YEARS
of Academic/Professional Education and Sector for 1974-75

Academic/ Professional Education (Years beyond Grade 12 or Year 4)	ELEMENTARY			
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>%</u>
0	31	130	161	.2
1	249	2,255	2,504	4.2
2	1,622	13,265	14,887	25.0
3	2,064	8,265	10,329	17.3
4*	3,201	5,515	8,716	14.6
5	7,081	8,503	15,584	26.7
6	2,487	1,812	4,299	7.2
7+	1,986	1,207	3,193	5.3
Not Reported	4	16	20	
	<u>18,725</u>	<u>40,968</u>	<u>59,693</u>	<u>100.0</u>

Academic/ Professional Education (Years beyond Grade 12 or Year 4)	SECONDARY			
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>%</u>
0	401	55	456	1.4
1	854	130	984	2.9
2	609	199	808	2.4
3	598	337	935	2.9
4*	2,470	1,499	3,969	11.9
5	6,560	3,661	10,221	30.6
6	7,465	3,161	10,626	31.8
7+	4,424	948	5,372	16.1
Not Reported	4	2	6	
	<u>23,385</u>	<u>9,992</u>	<u>33,377</u>	<u>100.0</u>

*Minimum level of Academic/Professional Education required
for Initial Certification in September 1973

Source: Ontario Ministry of Education, Toronto, September 1975.

marked at the secondary level where fewer than 16 percent have less than a degree. In accounting for this percentage it should be pointed out that teachers of vocational subjects are not required to hold University degrees to meet minimum certification requirements and thus many of those included in the number of secondary teachers not holding degrees are qualified by a different process.

The table shows that in 1975 slightly more than 46 percent of the elementary teaching force were possessed of less than the four years of Academic and Professional training required of all teachers entering the profession in 1973. Since the number of new entrants to the profession possessing the minimal qualifications is likely to be limited for the next decade, the relative importance of the group without the newly mandated minimal qualifications is likely to increase.

It has been generally assumed that the majority of under-qualified teachers were in those age groups approaching retirement and that the qualification of teachers would improve generally because retiring teachers would be replaced by those with higher levels of qualification. Table 1 indicates that only 20 percent of the elementary teaching force was of age 40 or over in 1975. Even if the entire group aged 40 or more had less than the current minimum required qualification, over 16 percent of those aged less than 40 in 1975 would have less than the minimum required.

Since this assumption is likely to be inaccurate, the proportion of the younger teaching force with less than minimum qualifications is likely to be much higher.

Nor would it be correct to assume that retiring teachers with less than minimum qualification will be always replaced by

teachers with the current mandated minimum or better qualifications. While it is true to say that since 1973 all new teachers entering the profession were required to hold an undergraduate degree, there is no regulation which would prevent a board from employing a teacher with less than minimum qualification provided the teacher obtained certification before 1973. There is some financial incentive for a board to do so. Educational Relations Commission data indicated that in 1977-78 the majority of School Boards could hire a minimally qualified teacher with maximum experience at approximately the same cost as a newly graduated teacher without experience. In addition to the immediate cost advantage there is the additional benefit that assuming both teachers remain in the employ of the board, there will be considerably lower future costs associated with the hiring of the minimally qualified maximally experienced teacher.

Nevertheless, many of those who entered the profession with less than minimal qualifications have taken advantage of the many opportunities available to improve qualifications up to the degree level. It may be pointed out, however, that currently the motivating factor to increase qualifications is the additional salary payable. Data from the Education Relations Commission indicated that at minimum experience the differential for each year of additional University education for elementary teachers can be as much as \$1,500 and at maximum \$2,500.

Since it is possible for a teacher to move horizontally and vertically on salary grids at the same time, it may be perceived that even when the bulk of the profession has moved beyond experience increments, they may become eligible for additional salary increases for educational qualifications. Whilst it is possible, therefore, to forecast that the substantial salary cost escalation as a consequence of experience may end by 1985, cost

escalation as a consequence of increased qualification may continue.

In fact, it might be reasonable to hypothesize that as annual salary increases become limited to cost-of-living adjustments, there will be an increasing tendency to seek higher qualifications as a means of improving income. Although not entirely relevant to the consideration of an aging teaching force, it must be pointed out that salary increases awarded as a result of improved qualifications do not necessarily reflect standardized increments of improvement in the knowledge base. An unfortunately large proportion of Ontario teachers seek improved qualifications through U.S. Universities, some of which have neither entry nor exit standards equivalent to Ontario Universities and which appear to exist mainly for the purpose of enrolling Canadian students.³

1.4.3 Policy Implications

The educational implications of this picture for the period of the decline are serious. Not only will the children of the future be facing aging teachers, but also may be facing under-qualified teachers. It would be legitimate to question the ability and willingness of such a group to provide the flexibility and innovativeness required of a system which will make increased educational demands which tend to be determined by consequent changing social and economic circumstances in the larger world.

There is in addition the questionable educational impact of

³Niagara University, Niagara Falls, U.S.A. derived in 1977 close to 75 percent of its Graduate Enrolment in Education from Canadian students. (Estimate supplied by Registrar, Brock University.)

current Ministry of Education regulations which permit Boards to reallocate teachers elsewhere in their system without ensuring adequate training or preparation. Given the likelihood of the maintenance of a seniority system in redundancy procedures, it is highly likely that redundant secondary school teachers in specialized areas may be reallocated to elementary schools over the course of the next 10 years without ensuring that such teachers have the skills or preparation necessary for dealing with younger children. If this happens there will be a compounding of the difficulties noted previously.

It is apparent that if the elementary teaching force is not to stagnate at a relatively low level of qualification, there must be provision for continuing opportunities for improving and updating skills. Given the relatively high cost of providing financial inducement at current rates for the upgrading process, it is possible that Boards of Education faced with increased revenue problems will tend to discourage such improvement. For instance, the Educational Relations Commission reports that in 1976-77, 30 percent of collective agreements provided no allowance for the attainment of a Masters Degree. For the year 1977-78 the percentage increased to 39 percent.

If a trend towards decreasing recognition of increased training does develop, it is reasonable to suggest that the Ministry of Education require that teachers take some form of continuing education or professional development to counteract the possible stagnation and loss of flexibility. Reduced demand for new teachers which is likely to prevail until 1985 will enable Colleges and Faculties of Education to provide this function by reallocating resources but after that date increased enrolment and increasing retirements will require an alternative approach.

1.5 Replacement of the Teaching Force

Total enrolment in the Ontario school system is projected to decline until 1984 after which there will be an increase until late in the 1980's. It has been suggested above that normal retirements plus attrition will accommodate for this reduction in enrolment. It has also been suggested that this period will see very few new entrants to the profession. Clearly the lack of opportunities for new teachers will result in pressures to reduce the output of Faculties and Colleges of Education with a consequent reduction in the capacity to prepare teachers. To permit this loss of capacity as a response to the lack of jobs for new teachers over the course of the next seven or eight years could provide the basis for a mini-crisis towards the end of this century and in the beginning of the next.

At the time of the increase in enrolment in the mid 1980's an increasing number of teachers will reach retirement age. Table 2 permits the following estimate based on the number of teachers in 1975 neglecting withdrawal and re-entry.

Number of teachers 55 years and older.

1975	7,144
1980	6,609
1985	9,233
1990	12,114
1995	18,036
2000	24,566
2005	33,139

Assuming that the supply and demand for teachers is in equilibrium by 1985 which given the current enrolment projections is conservative, there will be a need to replace almost 90,000 teachers in the twenty year period beginning in 1990. In crude terms this replacement will require an average of something like 4,500 teachers per year.

It may be noted here for the purpose of illustration only that in the year 1976-77 the total enrolment in Colleges and Faculties of Education in Ontario was 6,950.⁴ Given that this number was reduced by withdrawal and failure and that not all graduates intended to seek employment in the public school system, it is not unreasonable to suggest for the period following 1990 there will be a demand for graduates which will require a system not appreciably smaller than the current one. Given such a requirement for teacher education it would appear desirable to initiate steps to ensure a more even flow of retirements after age 55. It might even appear desirable to provide for early retirement of some in these large cohorts so that the problem of renewal could begin earlier, say by 1985. This alternative, however, must be viewed in the context of the probable difficulties facing the Superannuation Fund. Another and perhaps better means of evening out the demand on teacher training institutions would be to provide encouragement for the introduction of part-time contracts for both young and old teachers. Clearly such a policy, encouraged by government policy, could create a pool of teachers with some experience who would be able to work full time as the need increased. In addition there will be need to provide for lead time to indicate to the undergraduate enrolment in Universities that teaching may once more become a field with potential employment opportunities. It must not be forgotten that as the demand for replacement of the teaching force will be increasing, the pool of potential entrants in the University sector will be decreasing.

1.6 Summary and Observations

The Ontario teaching force in 1975 was relatively young,

⁴Ministry of Education, Education Statistics 1976, Toronto.

and inexperienced. A substantial number of the elementary teaching force possessed less than the minimal qualifications now required for entry to the profession.

It has been suggested that the reduction of the teaching force which will accompany declining enrolments until 1985 will be met first by retirement by those eligible and secondly by a reduction in the number of new entrants to the profession. The large cohort which was in 1975 young and inexperienced will be largely unaffected by the reduction in the total teaching force. This cohort will, however, become older and more experienced. Towards the end of the century the cohort will be approaching retirement age and create a dramatic upswing in the demand for new teachers which will be added to the demand arising as a consequence of the increasing enrolment of the 1980's at the elementary level and of the 1990's at the secondary level.

It is possible to make some observations about this scenario.

- (1) There will be some relief from escalating salary costs in the school system until 1985. This relief will be the result of most teachers having attained maxima on salary schedules.
- (2) The year to year relief will end by 1985 as a consequence of increasing new entrants to the profession entering the increment system and will rise more sharply after the end of the century as a consequence of the replacement of retirees.
- (3) The aging cohort which will predominate in the 1980's and 1990's may well become flexible and stagnant in their professional work but militant in their dealing with school boards. Steps should be taken which will ensure that this cohort be required to undergo continuing relevant education and professional development. Since financial motivation in salary scales may be difficult to provide, the government and the profession will need to recognize the need and be prepared to provide and finance the necessary opportunities.

- (4) Many of the aging cohort are possessed of less than minimum qualifications under current certification policies. Current salary structures provide financial motivation to improve informal qualifications. If it is assumed that a sizeable proportion of underqualified teachers will improve their qualifications, there will be an increase in average salary which will exceed the negotiated settlements during the 1980's.
- (5) The slackening of demand for new teachers may provide the opportunity for short-run economies in teacher education. Such economies should be directed more towards a reduction of current output than the elimination of potential capacity. The increase in enrolment of the 1980's and the replacement of the teaching force in the 1990's will result in the utilization of unused capacity even at current levels. Furthermore the role of continuing education will require the resources of the teacher training institutions in the period prior to 1985.
- (6) It may be possible to avoid expansion of teacher training capacity in the late 1980's and thereafter if deliberate attempts are made to create a pool of qualified and experienced teachers. One way of creating such a pool would be the encouragement of part-time teaching at both the upper and lower end of the age distribution. Such part-time teachers could then move to full-time contracts when the need arises.

1.7 Needed Research

- 1) The analyses provided in this section of the paper are derived from gross data reporting characteristics of the teaching force as a whole. There is a need for more detailed data on the characteristics of the teaching force by cohort.
- 2) Data on teacher characteristics currently available tends to be reported in ten year cohorts. For purposes of planning it is suggested that five year cohorts would be preferable.

2.0 THE SUPERANNUATION PROBLEM

2.1 Introduction

Before providing discussion of the Ontario Teachers' Superannuation Fund, it is considered appropriate to provide some background information on teacher retirement plans in Canada. The Canadian Teachers' Federation maintains a continuing interest in such plans and much of the data for this section has been provided by the Canadian Teachers' Federation.

While teachers in most countries of the world receive protection against a destitute old age, it is only in Canada, the United States and Great Britain that special plans for teachers are to be found.

When in Canada and Quebec Pension Plans were introduced in 1966 all but two of the provincial teacher plans were integrated with these plans. In 1972, the P.E.I. plan was also integrated, leaving Newfoundland as the only plan not integrated with CPP. The integration formulas used in most of the teacher plans result in an approximate, rather than exact, offset of CPP costs and benefits. As a result, teachers retiring in recent years have been receiving a combined benefit slightly higher than that which would have been payable under the teacher plan alone.

2.2 Features of Teacher Retirement Plans

As teacher retirement plans are relatively new, the forms they have taken have been based more or less directly on experience and thus there are many variations in detail. In recent years, however, it would seem that the plans have become more nearly alike than they were originally. For example, all the plans now calculate benefits on a final earnings basis, rather than service-pension or money purchase. Many variations, of

course, remain. Despite these, there are certain questions which every modern plan must deal with. These include:

2.21 Contributions and Funding

2.22 Level of Benefits

2.23 Cost of Living Increases

2.21 Contributions and Funding

(a) Source and Rate of Contributions

It has been generally established as a principle across Canada that in teacher retirement plans the government and individual should be jointly responsible for providing for old age.

While in most cases both government and teachers contribute to the retirement plans, the type of contribution made by each varies considerably. In so far as teachers are concerned, the yearly contribution is fixed at a specified percent of salary in all provinces. Until recently, teacher contribution rates varied from 3-4 percent in Newfoundland, through 5 percent in Alberta, Quebec and P.E.I. to 6 percent in the remaining provinces. As a result of recent changes, however, the basic contribution rates now vary as shown in Table 5 on the following page.

Except in the case of Newfoundland, an offset is applied to teacher contributions on YMPE (yearly maximum pensionable earnings) because of integration with the Canada/Quebec Pension Plan. The increases in teacher contribution rates have been made because of the introduction of indexing and other benefits into the teacher plans. It will be noted from the table that the contribution required of teachers in Ontario is greater than that required of teachers in all provinces other than Quebec.

Where the government is concerned, a number of arrangements are in effect, varying from flat grants to matching contributions.

Table 5

TEACHER CONTRIBUTION RATES IN TEACHER PENSION PLANS

British Columbia	6.5%
Alberta	5%
Saskatchewan	6.35%
Manitoba	6%
Ontario	6% + 1% to Superannuation Adjustment Fund
Quebec (teacher plan)	7.09%
Quebec (public plan)	7.5% of salary in excess of 35% of maximum pensionable earnings under Quebec Pen- sion Plan
New Brunswick	7%
Nova Scotia	6.5%
Prince Edward Island	6.5%
Newfoundland	3% (single) 4% (married)
N.W.T., Yukon (federal plan)	7% (7.5% in 1977)

Source: Channon, G. Teacher Retirement Plans in Canada
(Ottawa, C.T.F. 1976)

In British Columbia, Ontario and Nova Scotia, the province matches teacher contributions. In Alberta, the province pays 100 percent of allowances for non-contributory service and 50 percent for contributory service. In Saskatchewan, the province transfers sufficient money from general revenue to ensure payment of current allowances. In Manitoba, the province pays a monthly share of the cost of pensions, including half of all pensions granted since July 1, 1963. In the four remaining provinces, the government makes up the difference if any, between contributions and allowances payable.

(b) Disposal of Moneys Collected

There is considerable variation among the provinces as to what is done with the money collected from employees and employer.

In B.C., Manitoba, Ontario and Nova Scotia trust funds have been established to receive and hold in reserve the contributions of both teachers and government. In Saskatchewan, Alberta and Prince Edward Island only the teachers' contributions are held in reserve. In the Quebec teachers' plan and in New Brunswick and Newfoundland there is no fund for either teacher or government contributions. The various plans thus represent levels of funding varying from "frozen deficit" to "pay-as-you-go" (i.e., no fund). None of the plans could be described as fully funded, that is to say, with assets that will at any time provide for the payment of all pension and other benefits required to be paid under the terms of the plan in respect of service rendered by employees and former employees prior to that time.

(c) Protection of Contributors' Rights

A major source of protection for contributors to retirement plans lies in the method of funding the plan. For plans in the private sector of the economy, it is generally agreed that only fully funded plans provide sufficient protection of employee rights. The reason for advising such strict controls is that there have been too many examples of major industries which have waned and of large companies which have gone into bankruptcy with insufficient money in their pension funds to meet the demand and refunds. In fact, problems with private sector plans have led to federal government and five of the provinces including Ontario to enact Pension Benefits Acts (or their equivalent) to regulate funding and benefits in these plans. These acts specify the level of funding which must be maintained, vesting requirements which must be met, and steps to be followed in the event of dissolution of a plan.

These considerations are probably less important in the case of government-sponsored plans because of the access to presumably

unlimited tax resources. However, it is necessary to consider the problem of inter-generational transfer of costs. In pay-as-you-go or partially funded plans, the cost of pensions for one generation becomes the responsibility of the next generation of teachers and taxpayers. Under certain economic conditions, this burden might become sufficiently heavy to make that generation of contributors unwilling to assume it, with the possible result that the benefits promised by the plan could not be paid. Clearly the effect of such adverse economic conditions will be heightened by an increase in the number of pensioners receiving higher benefits as related to the number of those making contributions.

Where plans are funded or partially funded several other forms of protection may be built into the plan, including specifications regarding investment policy, actuarial survey and guarantees of funds deficits and interest rates. Investments in most of the funded plans are restricted to securities guaranteed by government, or authorized under Trustee or Insurance Companies Acts. Several provinces, however, have broadened their policy to include investments in stocks and mortgages. Strict investment policies offer protection in times of economic instability. On the other hand, in times of economic growth they place a considerable restriction on the investment return which might otherwise be obtained.

Of the provinces with funds, only British Columbia, Alberta, Ontario and Prince Edward Island have general government guarantees against fund deficits. Saskatchewan guarantees current payments and Manitoba makes up any deficits in the employer section of the fund. In the provinces without a fund there is an implied guarantee in that the government contributes from general revenue an amount sufficient to make up the difference between contributions and allowances payable.

A guaranteed interest rate on funded contributions is found in only three of the plans -- those of British Columbia, Ontario and Nova Scotia. All of the funded plans provide for actuarial surveys. Prince Edward Island, however, notes that the survey is made only as directed by the Minister, rather than at specified intervals.

In general, then, it may be concluded that efforts are made in most of the teacher plans to protect the rights of contributors, although the methods chosen and the degree of protection afforded vary considerably from province to province.

2.22 Level of Benefits

There are various principles upon which the level of benefits provided by retirement plans may be based. If length of service is given major consideration, a service-pension plan may result. The thinking behind this plan is that all years of teaching service by all teachers are of equal value, and that therefore the allowance paid should equal years of service times a flat rate, without reference to salary earned or contributions. A number of the teacher plans were, at an earlier stage in their development, set up in part as flat rate service plans.

Another principle upon which benefits may be established is the level of contributions. This type of emphasis may result in a money-purchase, annuity plan, or in a career average plan. Again, some of the teacher plans incorporated money purchase features at an earlier stage of their development.

Today, however, all the teacher plans are of the final earnings type, with the retirement benefit related to years of service, salary earned during the last few years of teaching, and age of retirement. In this type of plan it is assumed that the salary

earned by a teacher has enabled him to establish a certain standard of living and that the pension granted should enable him to maintain a comparable standard during retirement (taking into account the reduced needs and expenses of elderly people). In other words, the concept of adequacy has been introduced into teacher pension plans. Moreover, in recent years, maintenance of purchasing power of the retirement allowance has been added to the definition of adequacy, with the result that the majority of plans now provide for the indexing of benefits in accordance with increases in the cost of living.

Adequacy is not perhaps definable in absolute terms. However, practice in the teacher plans indicates that the definition currently given adequacy is represented by a benefit formula of $2\% \times \text{years of service up to } 35 \times \text{average salary for last or best } 5 \text{ years}$. Exceptions are Saskatchewan (6 year average) and Ontario and Manitoba (7 year average).

Although the formulas are quite similar, application of the formulas results in quite different allowances from province to province. Table 6 below shows the maximum allowance payable in each province to two teachers A and B at age 65 with 35 years' service upon retirement in the summer of 1975. The amounts payable from CPP and OAS (\$3,171 per annum) are included. It should be noted that in Ontario the pension payable before the age of 65 is as stated below, but will be reduced by the amount of CPP when this becomes payable.

The retirement benefit payable in 1975 varied from 78 to 85 percent of final year's salary for Teacher A and from 63 to 73 percent for Teacher B. The Ontario plan provides for the lowest pension for Teacher A of the eleven plans and ranks 8th out of the eleven for Teacher B.

Table 6

ALLOWANCES PAYABLE TO TWO TEACHERS
at Age 65 with 35 Years of Service, Retiring in Summer of 1975¹

Province	Teacher A's Allowance based on final salary of 2 \$9,292	% of Final Year's Salary	Teacher B's Allowance based on final salary of 2 \$19,800	% of Final Year's Salary
B.C.	\$7,597	82%	\$13,619	69%
Alta.	7,705	83	13,947	70
Sask.	7,511	81	12,401	63
Man.	7,429	80	13,230	67
Ont.	7,263	78	13,064	66
Que. (Teachers)		Lowest		
Que. (public)				
N.B.	7,887	85	14,373	73
N.S.	7,522	81	13,433	68
P.E.I.	7,913	85	14,075	71
Nfld.	7,810	84	13,678	69
N.W.T., Yukon				

¹The Ontario Teacher would receive these amounts provided age + service equalled ninety years.

²The amounts of final salary are illustrative only and are intended to reflect average conditions prevailing across Canada for elementary and secondary school teachers.

Source: Channon, G. Teacher Retirement Plans in Canada
(Ottawa, C.T.F. 1976)

The allowances payable are also dependent upon the counting of various types of service in the teachers' plan. All provinces give full or partial credit for service in the province before the retirement plan was set up, for military service and for absence on extended sick leave. Eight provinces including Ontario allow credit for one or more years of study leave. Other types of leave for which contributions may be made in one or more plans include jury duty, elective public office and maternity. The Prince Edward Island plan provides a limit of two years in a lifetime for all types of leave.

2.23 Cost of Living Increases

A continuing problem for retirement plans in recent years has been the problem of upward adjustment to meet inflationary pressures in the economy. Originally, this problem was approached through ad hoc adjustments of pensions granted earlier. In 1969 only the Quebec plan provided for continuing escalation of teacher allowances. Now, however, as may be seen from Table 7, nearly all of the teacher plans provide for some form of continuing escalation.

2.3 Summary and Observations

From this brief summary of the major characteristics of teacher retirement plans across Canada it becomes apparent that the Ontario plan, while perhaps not the most generous in terms of comparative benefits and required contributions, certainly possesses most of the characteristics which would make it attractive from a teachers point of view. In common with other Teacher Retirement schemes, the Ontario plan is not fully funded, but has governmental guarantees against fund deficits. Because Canadian plans are not fully funded any extension of benefits will impose a future burden on Provincial Government Finance.

Table 7
CONTINUING ESCALATION FEATURES
in Teacher Retirement Plans

Province	Type of Escalation
B.C.	Escalation by CPI every 3 months starting April 1, 1975
Alta.	Ad hoc adjustments
Sask.	Escalation by CPI, based on October to October comparison, effective the following January
Man.	Escalation by CPI
Ont.	Escalation by CPI to maximum 8% with excess carried forward to a later year
Que.	Escalation by CPI
N.B.	Escalation by CPI to 6% per year
N.S.	Escalation by CPI to maximum 4%
P.E.I.	Escalation by CPI to 8% per year
Nfld.	None
N.W.T., Yukon	Escalation by CPI

Source: Channon, G. Teacher Retirement Plans in Canada
(Ottawa, C.T.F. 1976)

If the benefits and provisions for escalation are in excess of those provided for the public as a whole, it is to be expected that public opposition to special plans for teachers may grow, particularly if the burden on enrolment increases. The extent of this future burden is examined in the next sector of this paper.

3.0 THE ONTARIO SUPERANNUATION PLAN

3.1 Teachers' Superannuation Fund - General

The Teachers' Superannuation Fund began receiving contributions on April 1, 1917. The Fund is administered by the Teachers' Superannuation Commission in accordance with the provisions of The Teachers' Superannuation Act. The Commission issues an annual Report to Contributors for its fiscal year, which has been from November 1 to October 31, but which now coincides with the calendar year. In addition, it publishes periodically a Synopsis of the Teachers' Superannuation Act and Regulation, the most recent of which was for 1975. Every three years a Report of the Actuary is made to the Commission and this is released to the public. The last was the eighteenth which set out the condition of the Fund as at December 31, 1975.

Changes in the Act are through amendments by the Legislature to the Teachers' Superannuation Act. Changes in the Regulation are made by the Provincial Cabinet by authority contained in the Act. There is in addition an Act, the Superannuation Benefits Adjustments Act enacted in 1975 which sets up a separate fund to provide for escalation in accordance with changes in the cost of living as reflected by increases in the Consumer Price Index.

3.2 Unfunded Liability

The funding of the Ontario Superannuation Plan is based on an actuarial cost approach. Such an approach requires that the total annual contributions to the fund should be equal to the

present value of benefit liabilities which have accrued during the year. If there is an excess of present value of future benefits over the sum of assets and the present value of contributions an unfunded liability will result. Unfunded liabilities may arise from a variety of causes among the most important of which are:

- 1) Less than adequate rates of contribution,
- 2) Increases in benefit incurred after inception of the fund,
- 3) Unrealistic actuarial assumptions.

Estimates of unfunded liability provide an estimate therefore of the amount which would be required to fully fund the pension plan at the time the valuation is made. This estimate is of much more significance in the operation of a private fund than a government fund since the ultimate responsibility for providing benefits under the plan is that of the Government which has, it is presumed, the resources to make good at any time any deficiencies which may arise from the year to year operation of the fund. Whether or not Government pension funds should be fully funded is a political and social argument as well as an economic one. Without attempting to enter this argument, it is relevant to note that estimates of unfunded liability of public pension plans provide an assessment of future governmental liability for meeting benefits.

The discussion of unfunded liability therefore should not be permitted to obscure the fact that in the formation of policy about superannuation the most significant factor related to the yearly demands on current revenue of the province to meet any deficiencies arising out of excesses in pensions paid out over contributions.

3.3 Current and Future Unfunded Liability Superannuation Fund

The Teachers' Superannuation Fund was established on April 1,

1917. From its inception it had an unfunded liability which, by December 31, 1966, had increased to \$328,282,000. This "initial" liability was created because the contributions to the Fund were inadequate to finance the combination of benefits provided between the years 1917 to 1966 and the commitments made during that period to future pensioners. For a private pension plan it is necessary that initial unfunded liability be amortized over a period of years. However when the Pension Benefits Act of 1965 was enacted it was recognized that the amortization payments required in the case of a Private Pension Plan were unnecessary because of the guarantee of government administration. The legislation therefore permitted the government to limit such payments to such sums as were necessary to prevent any increase in the initial unfunded liability. These sums may be conceived of as interest on the initial unfunded liability. Since 1973 the Province of Ontario has been committed to the payment of "interest" at the rate of six percent on this sum or \$19,696,920 annually. This payment must be made from the Consolidated Revenue Fund of the province to which all taxpayers contribute.

During the six year period from January 1, 1967, to December 31, 1972, inclusive, an additional liability of \$229,595,000, known as the "residual" unfunded liability, was created. The actuaries reported that this increase in unfunded liabilities was due to plan amendments providing additional benefits. Under the provisions of The Pension Benefits Act, 1965, this liability must be amortized by annual payments of principal with interest at six percent per annum. This means that the minimum payment must be \$21,913,650 per annum during the seventeen year period ending December 31, 1989. Since no additional contributions were required of teachers to finance the additional benefits, the whole amount of \$21,913,650 must also be paid from the Consolidated Revenue Fund of the province.

During the period of January 1, 1973 to December 31, 1975, the date of the most recent actuarial report, the total unfunded liability increased by \$865 million to \$1,397 million. The actuaries report that the increase in unfunded liability was due to increases in the general level of salaries since 1972 in excess of those anticipated in that valuation, changes in assumed future rates of interest and general salary increases and changes in other actuarial assumptions. In accordance with the Ontario Pension Benefits Act the unfunded liability of \$1,397 million should have been financed by a schedule of annual payments beginning on December 31, 1976 with a total amount of \$144,436,000. Since each portion of unfunded liability will be amortized over a 15 year period required by law, the total amount to be paid will change with each actuarial valuation. Table 8 provides the details of each annual payment associated with the three year valuation period.

<u>Table 8</u>		
MINIMUM ANNUAL PAYMENTS TO FINANCE UNFUNDED LIABILITY		
<u>Year of Related Actuarial Valuation</u>	<u>Annual Payment</u>	<u>Date of Final Payment</u>
1966	22,980,000	payable in perpetuity
1972	21,914,000	December 31, 1989
1975	5,865,000	December 31, 1980
1975	93,677,000	December 31, 1990

Source: Actuarial Report on the Teachers' Superannuation of the Province of Ontario, December 1975, June 30, 1977

The total annual payment of \$144 million was equal to about \$1,215 per active teacher or 8.1% of the annual salary of active teachers on the valuation date of December 31, 1975. It should be noted that this amount, payable from general government funds is in addition to the 6% of annual salary required to match

teacher contributions to the fund also payable from general funds. Based on the annual rate of earnings at December 31, 1975 of \$1,791 million this contribution is approximately \$107.5 million. Together, therefore, the total payment required from government for 1976 (neglecting the effect of salary increases) to keep the fund actuarially sound would be some \$252 million. For comparative purposes it is worth noting that in 1976 total grants to school boards were some \$1,705 million.⁵ Thus, the required Provincial contribution to the Superannuation Fund amounted to almost 15 percent of total school grants.

The Public Accounts 1976-77 show that \$34 million was paid in respect of the initial unfunded liability and a further \$43 million in respect of the residual unfunded liability for a total of \$77 million. It should be noted, however, the discrepancy between the actual payment and that required by the actuarial valuation may be accounted for by delay in the publication of the actuarial valuation until 1977. Nevertheless even if the Province begins the schedule of payments required by the valuation in fiscal year 1978 there will be an increase in total unfunded liability of a further \$140 million which will need to be amortized and added to the schedule payments.

3.4 Current Account

From the point of current operations the Revenue and Expenditure account on the Fund shows that in the year ended December 31, 1976, total pensions and withdrawals paid amounted to close to \$112 million. Revenue from participants in the teacher force amounted to almost \$106 million. The contribution of the

⁵Ministry of Education, Education Statistics Ontario, 1976, Toronto, Queens Printing, 1977, p. 126.

Provincial Government of \$83,441,754 together with the Provincial payments on unfunded liability made up for the difference between current contributions and payments and contributed to the \$257,178,091 excess of revenue over expenditure to be added to capital.

In addition to the annual payments required to meet unfunded liabilities, the government is required to meet from consolidated revenue the costs of low-pensions and cost-of-living subsidies granted to pensioners of the Teachers' Superannuation Fund between 1967 and 1975. In 1976-77 this payment amounted to \$25,649,400.

3.5 Superannuation Adjustments Benefit Fund

In 1975, the automatic escalation of teachers' pension in accordance with changes in the Consumer Price Index was introduced. The provision was enacted through passage of a new law and a new fund, the Superannuation Adjustments Benefits Fund was created. This fund is financed by contributions of 1% of the salary of teachers and a matching 1% from the Province. The fund is administered separately by the Provincial Treasurer and differs in three major respects to that of the Superannuation Fund itself.

- 1) There is no requirement for actuarial costing or valuation.
- 2) There is no provision for unfunded liability.
- 3) The rate of interest is determined by order in Council.

Furthermore the act specified that no change in the rates of contribution will be made before January 1981.

The statement of account provided in Public Accounts 1976-77 for the Superannuation Adjustments Benefit Fund shows that at the close of the financial year the fund amounted to \$62,382,120, an increase over the previous year's \$18,886,460. Disbursements

during the year amounted to \$86,484 for pensioners and \$277,901 for refunds of contributions. Contributions from Government and contributors amounted to 19.4 million each. At this point in time, therefore, the Superannuation Adjustments Benefit Fund is increasing at a healthy rate.

3.6 Future Problems of the Funds

Future demands on the resources of the Province will derive from four sources:

- 3.61 An increase in interest payments on unfunded liability which may become apparent at the time of the next actuarial valuation in 1978.
- 3.62 Payments required under section 8 of The Teachers' Superannuation Act whereby the Province is required to make up the difference between receipts into the fund and required payments to pensioners.
- 3.63 Subsidy and cost of living payments to those who retired before 1976.
- 3.64 Any deficiencies of the Superannuation Adjustment Benefits Fund.

3.61 Increase in Unfunded Liability

The Actuarial Report of 1975 recommended that the statutory Teacher-Province contribution should be increased from the current 6% less Canada Pension Plan to 6.4% (less CPP) if the matching contribution principle is to be maintained and if the teachers rate is not to increase to 6.7% (less CPP). Since no increase in rate has been applied, it is almost certain that the unfunded liability will increase by the 1978 valuation thus requiring additional amortization payments by the province in addition to the \$141,436 currently required.

Additional unfunded liability may arise as a consequence of a difference between actuarial assumptions and experience.

Jump⁶ has suggested that the two most important actuarial assumptions are those relating to the rate of future salary increases and the future rate of interest. The 1975 valuation assumes that future investment earnings will be 7% and that future salary increases will be 9% in 1976, 7% in 1977, 6% in 1978 and 5 1/2% thereafter.

The Ontario Economic Council⁷ has projected that the yield on long term Government of Canada bonds during the period of the projection (1987) will average around 7.5% (p. 160). It is noted that this rate is lower than that at which the Provinces may borrow (p. 196) and the Superannuation Commission Report to contributors for 1976 shows that Ontario debenture purchases in 1976 are at rates higher than the 7% assumption. Provided that the projections are sound, it may be reasonable to suggest that, as a consequence of underestimating the long term yield on bonds, unfunded liability may not increase. On the other hand, the failure of the Provincial Government to meet amortization payments from 1975 to 1978 will undoubtedly show up in the 1980's as further unfunded liability and will necessitate additional annual payments. Using the same actuarial assumptions used in the 1975 valuation, the two annual payments would amount to \$288,872,000 and would require additional payment of just over \$31 million raising the annual payment to \$175,000 until 1980 and from then to 1989 to \$170 million.

Insofar as the rate of salary increase is concerned, it may be that the projected rate of growth is too conservative. The

⁶Jump, Bernard, "Teacher Retirement Systems," Journal of Education Finance III:2, Fall 1977, p. 155.

⁷Foot, D.K., J.E. Pesando, J.A. Sawyer, and J.W.L. Winder, The Ontario Economy 1977-1987 (Toronto Ontario Economic Council 1977).

actuarial valuation assumes growth rates of 9% in 1976, 6% in 1978 and 5 1/2% thereafter. The Ontario Economic Council⁸, however, suggests that government sector wage increases (which it assumes will be the same as commercial sector increases, p. 47) will be in the following range.

1976	11.0
1977	9.1
1978	8.2
1979	7.0
1980	6.4
1981	6.0
1982	6.2
1983	7.1
1984	7.1
1985	7.3
1986	7.4
1987	6.9

Source: Foot et al., The Ontario Economy 1977-87, Toronto, Ontario Economic Council, 1977, p. 56-57.

As has already been noted above there has been a tendency for the average teacher's salary to increase more rapidly than may be accounted for by adjustments for inflation and productivity because of increments for experience and increased qualification and as a consequence the above projections may be conservative. Although some respite is expected in the 1980's from the experiential effect, it is highly likely that a substantial increase in unfunded liability will become apparent in the 1978 valuation as a consequence of the underestimation of future salary increases. The valuation assumes a growth in salaries between 1976-1980 of something in the order of 30%. The projections of the Council would suggest the figure is likely to be in the order of 41%.

A further actuarial assumption which might give cause for

⁸Ibid.

concern is that related to the assumed retirement rates.

Table 9 below sets out these rates.

<u>Table 9</u> ASSUMED PROBABILITIES OF RETIREMENT AMONG TEACHERS Eligible for 'A' Pension*				
Age at Retirement	1975 VALUATION		1972 VALUATION	
	Males	Females	Males	Females
55	.15	.20	.02	.08
56	.15	.20	.05	.09
57	.15	.20	.09	.10
58	.17	.20	.14	.15
59	.10	.20	.19	.20
60	.25	.25	.24	.24
61	.25	.25	.30	.27
62	.25	.25	.40	.30
63	.25	.25	.35	.30
64	.40	.40	.40	.45
65	1.00	1.00	1.00	1.00

*'A' Pension in full is payable at age 65 or when age and years of service total 90.

Source: Actuarial Report Teachers' Superannuation Fund,
June 1977.

The change in assumptions between the 1972 and 1975 valuation is based on the three years experience. Experience, therefore, indicated a sharp increase in the actual number of those taking advantage of early retirement on full pension. It may be hypothesized that future experience will show these assumptions to be conservative for two major reasons.

First the introduction of the Superannuation Adjustments Benefit Act in 1975 providing escalation of pension benefits overcomes a major deterrent to retirement at earlier ages which existed during the experience period. Secondly the declining enrolment situation has and will tend to lead to collective agreements which will encourage earlier retirement. It is interesting to note in this connection that the Provincial overview of Teacher-Board Collective Agreements for 1976-77 published by the Educational Relations Commission did not report on Retirement Gratuities, whereas the 1977-78 report notes that 92% of agreements signed included superannuation as a criteria for payment. School administrators freely admit that in the current financial squeeze it would be financially advantageous to encourage early retirement and replacement by a teacher at a lower level of salary even if the problem of declining enrolments were not present. This trend to encouraging earlier retirement will mean a shift to the provincial government the onus of providing for the redundant teachers.

Since early retirement will affect the unfunded liability dramatically, there is a demonstrable need to attempt some simulation of the effect of changes in this assumption.

Summary

It would appear reasonably certain, therefore, that the unfunded liability of the Superannuation Fund will increase

dramatically by the time of the next valuation. This increase will result from the following factors.

- 1) Failure of the Province to mandate increased contributions to the Fund.
- 2) Failure to make total amortization payments in 1976 and 1977.
- 3) Possibly conservative assumptions of future salary increases.
- 4) Possibly conservative assumptions of retirement rates.

It is not possible to make estimates about the size of the increase, but the development of a simulation capable of dealing with necessary changes in actuarial assumptions would contribute to a clearer estimate of the problem.

3.62 Deficiencies in Current Accounts

Amortization payments on unfunded liability are included as revenue in the annual statement of Revenue and Expenditure of the Fund. Provided that the annual payments plus interest contributions to the fund from participants and Government balance the pension payments and refunds to contributors, there is no need for additional Government payments. As has been shown for the year ended December 1976, the contributions from participants of \$105,915,600 less than matched the pensions and withdrawals of \$112 million. The Ontario Economic Council projects that the net flow of funds to the Province from pension sources including the Teachers' Superannuation Fund will decline steadily during the period 1977 to 1987 and become negative by 1985-86.⁹

The decline reflects the reversal of trend of the 1960's and early 70's when a combination of an increasing number of teachers in service and increasing salaries relative to the number of

⁹Ibid., p. 171.

retired teachers provided huge sums of money for investment.

As the preceeding discussion has suggested, declining enrolments during the early 1980's will see fewer new entrants to the teaching profession and a trend towards offsetting redundancy by earlier retirements, it is possible that the current account will fall into deficit earlier than 1985. Furthermore, earlier retirement has a cumulative effect inasmuch as pensioners can expect to receive pensions for a longer period. Unfortunately it is not possible to make accurate projections at this time as to the extent of the deficit.

In order to forecast the potential government contribution under section 8 of the Superannuation Act, it would be necessary to make estimates of the ratio between active teachers and pensioners. Such an estimate would depend heavily on assumptions currently included in the actuarial valuation and preferably be designed in such a way that the effect of changes in the assumptions could be measured.

The significance of such a ratio may be gauged from the contributions required to pay the first year's pension of a retiree. Given that the pensioner will receive 70% of his best seven years and that a participant will provide through his own and a matching government contribution twelve percent of his annual salary, a rough ratio may be calculated. Neglecting that the average salary upon which the retirement benefit is calculated is likely to be higher than the average salary of the contributors, the figure of six active teachers to one pensioner appears not unreasonable. The ratio can be maintained (for a constant size teaching force) only if one pensioner ceases to draw pension as another becomes eligible. If the teacher ceasing to draw benefit is replaced by a teacher with a higher level of pension in the second year, the need for a higher ratio is demonstrated.

Since it has been shown that contributions received (less amortization payments and interest) in 1976 almost equalled benefits paid out and since Table 2 suggests a steadily increasing number of those eligible for retirement, then it may be assumed that even for 1977 the required ratio will not exist. Since the size of the teaching force is being reduced and thus the ratio and total contribution, it is suggested that the fund will be relying on amortization payments and interest within two years.

It would not be unreasonable to predict that a crisis will occur in the late 1980's or early 1990's when the cohort aged less than 40 in 1975 will reach retirement age.

Even at this stage it is clear that the provincial Government needs to increase substantially the required contribution from teachers to provide relief on the current account. It is also suggested that policy needs to be directed towards maintaining or improving the ratio between pensioners and active teachers. Previous discussion has suggested that this may be achieved either by restricting early retirement or by increasing the number of active teachers. Alternatively, although this may prove to be politically and socially unacceptable, it may be suggested that Government prohibit the development of policies which ensure that younger teachers, who will be paying into the fund for longer periods of time, are released at the expense of teachers who are approaching retirement age. It is doubtful if the introduction of new policies which would provide for earlier retirement under partial pension would be a solution since any saving on the amount of the pension would be offset by the longer period of life expectancy. Indeed it would appear that without substantially increasing the rate of teacher contributions, only a reduction of present benefits will avoid a crisis in the years to come. The need to make an early start on remedying the

situation is emphasized since if the situation is permitted to develop unchecked, there is the possibility that deficit payments required in the 1990's may be so large as to create public outcry and sudden curtailments of benefits.

Summary

The Government is already committed to substantial payments to the current account in recognition of unfunded liability. It is also legally committed to making up deficiencies in the current account when the total of contributions together with amortization payments and interest is less than that required to meet pensions. One of the key factors in projecting the required deficiencies, the ratio between participants and pensioners in future years, is not available. All evidence suggests that the ratio between contributors and pensioners will decrease at an increasingly rapid rate leading to a proportionate increase in the utilization of amortization funds and interest payments. Of significance in this problem is the anticipated policy of Teacher-Board contracts to encourage early retirement as a means of protecting younger staff against redundancy and as an attempt to reduce cost. Such a policy will result in a shifting of the cost of redundancy to the Provincial Government in the form of increased requirements for deficiency payments. Because of the anticipated size of these deficiencies under present conditions, it is suggested that immediate increases in contribution are necessary and that attempts to solve the anticipated teacher redundancy problem during the period of declining enrolments by means of early retirements be resisted.

3.63 Subsidy and Cost of Living Payments

The number of pensioners who are eligible for these subsidies was 17,113 in 1976-77. The Government payment amounted to

\$25,649,400. Since 1975 the Government has shown a tendency to escalate low pension benefits at rates similar to those provided by the Superannuation Benefits Adjustment Act. It may be assumed that the total payments under this provision will increase in accordance with inflation but that they will be offset by savings derived from those ceasing to receive benefit as they or their spouses die. It may be pointed out that of the almost 16,000 non disabled pensioners reported in 1975, 3,823 or almost 24% were 75 years of age or older.

3.64 Superannuation Adjustments Benefits Fund

As noted previously this fund is administered in a manner which may justify its being treated almost as a current fund. Any monies which remain after escalation payments have been made become available for Provincial borrowing and any deficits are made up out of Consolidated Revenue. The interest on the surplus may be viewed as additional government contribution to the fund and this interest is in turn available for government borrowing provided that expenditures do not exceed revenue.

If the current operation of the fund falls into deficit, the Provincial Government will be denied another source of capital and will be required to pay out of current income the amount of deficiency. For the purpose, therefore, of future educational finance and the demand on future Provincial revenues, attention should be focussed on the current account.

An actuarial cost valuation would provide some guide to future financial requirements but more significant information would be provided by a simulation of current operations projected into the future.

The fund in any given year will require no additional revenue from Consolidated Revenue provided that the combined contributions

of teachers and Provincial Government is equal to or greater than the escalation in pensions. In more exact terms the fund will remain healthy as long as 2% of total salary increase in a given year is equal to or greater than the increase in consumer price index applied to the total amount of pensions paid in that year. The significant factors in examining the problem are therefore:

- 1) The total increase in salary of the teaching force in each year.
 - 2) The total increase in basic pensions paid in each year.
 - 3) The rate of inflation as measured by the C.P.I.
1. The total increase in salary of the teaching force for any year will be determined by the number of teachers and the average salary increase. It is projected that the total number of teachers will decline during the 1980's. It has also been suggested that the annual rate of total salary increase will decline during the 1980's as a consequence of most teachers reaching maximum on salary grids, fewer teachers entering the profession and public resistance to higher salaries in the public sector.
 2. The rate of increase in total pension payments is bound to accelerate during the 1980's as a consequence of increasing numbers reaching retirement age and the cumulative effect of earlier retirement ages.
 3. Although the Economic Council of Ontario forecasts a decrease in inflationary pressures during the period 1977-87¹⁰ as a consequence of assumptions about slow recovery from the 1975 recession, there is little current evidence that inflationary problems are behind us. For instance, the increase in CPI

¹⁰Ibid., p. 18.

for 1977 of over nine percent means that pensioners who have retired since 1975 will receive an adjustment of an additional one percent for the next year because of the carry over provisions.¹¹ This assumes that the inflation rate for next year will fall below eight percent.

As in the case of operation of the Superannuation Fund itself, one of the most valuable pieces of information necessary to make alternative projections of the financial future of this fund would be a series of projections under differing assumptions of the ratio between active teachers and pensioners.

While the evidence suggests that the Superannuation Adjustments Benefits Fund will face certain and substantial deficits in the 1990's when the current large cohort now in their 30's and 40's retire, it may well be that serious difficulties will occur before that time. Specific research is needed on this question.

3.7 Summary and Conclusions

This examination of the Ontario Teachers' Superannuation Program has shown that Ontario teachers have a retirement program which although not noticeably more generous than those for other Canadian teachers, offers retirees the prospect of living out their declining years in a measure of comfort.

The benefits which may appear relatively generous to employees in the private sector were established at a time of growth both of school systems and the economy. A protracted period of declining enrolments and slower economic growth will create massive problems for the Provincial Government in financing these benefits.

¹¹ See Table 7 (p. 33). Even if the rate of inflation next year as measured by the C.P.I. should be zero, Ontario pensioners would receive a one percent increase.

Some hint of future difficulty is provided by the growth of annual payments required to meet unfunded liability from \$41,610,570 in the years 1973 to 1975, to \$144,436,000 beginning in 1976. These payments together with the government contribution in respect of active teachers for 1976 amounted to close to 15 percent of total school grants. These amounts will be actuarially adequate to meet future pension benefits only if contributions are increased by close to 1% of total salary and if the actuarial assumptions upon which the valuation is based are borne out by experience. A brief discussion of the most critical of these assumptions suggests that they are overly optimistic. One of the more critical assumptions is that relating to the probabilities of retirement between 55 and 65 years of age. It is argued that teachers and Boards will well seek to encourage early retirement as a means of meeting problems of declining enrolment and revenue problems and thus increase the probabilities assumed in the valuation. Government support of such policies would increase the potential liability both unfunded and current greatly. It has been suggested that unfunded liability will increase by the time of the next actuarial valuation.

Amortization payments on unfunded liability together with interest and contributions constitute the annual source of funds from which basic pensions must be paid. Any annual deficiencies in these amounts will require additional government contributions from current revenue. It has been suggested that this requirement will arise by 1985 or earlier. The required amounts will increase dramatically as the ratio between active teachers and pensioners declines as it is bound to do in the 1990's as a consequence of declining enrolments, heavy retirements of teachers who began their careers in the 1960's and earlier retirement ages.

To the above deficiencies should be added payments by the

Provincial Government in respect of low pensioners and cost of living adjustments made to teachers retiring before 1975. Mortality rates may be expected to offset these amounts which although not inconsiderable in themselves constitute a relatively small proportion of total government contributions.

Additional government funds will be required to meet any deficiencies of the Superannuation Benefits Adjustment Fund. Since there is no requirement for actuarial cost valuation and no information about the assumptions on which the rate of contributions to the fund are based, it is suggested that this fund be considered as a current fund. Current contributions to the fund have provided a substantial balance of contributions over expenditures since its inception. However, this rapid increase is to be expected in view of the substantial increases in salaries which have prevailed together with the very high ratio of active teachers to pensioners. Since the next decade will see a reduction of both the number of active teachers and the rate of salary increase, it is clearly likely that deficiencies will occur. The size of the deficiencies will increase as the ratio between active teachers and pensioners declines. Should the rate of salary increase fall below the rate of inflation, the problem will be compounded.

There are two major conclusions which may be drawn from this study. The first is that in view of the future demands upon the Superannuation Funds, it would be unwise to consider any extension of benefits as a means of solving the problem of teacher redundancy for the next two decades. The second is that some increase in teacher contribution to both Superannuation Fund and Superannuation Benefits Fund is not only justifiable but necessary. This increase is not necessarily required immediately but should be planned for the period when the ratio between active

teachers and pensioners declines sharply. The third and perhaps most important conclusion is that whilst actuarial cost valuation can provide some indications of future liability, it has limited use in making estimates of future obligations under the current account. There is need for the development of simulation which can provide such data.

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